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U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

N/Y 09/622082

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

INTERNATIONAL APPLICATION NO.
PCT/FI99/00075INTERNATIONAL FILING DATE
February 3, 1999PRIORITY DATE CLAIMED
February 9, 1998**TITLE OF INVENTION****APPLICATION FOR A LAYER OF ADMIXTURE IN THE WEB FORMER UNIT OF A BOARD MACHINE****APPLICANT(S) FOR DO/EO/US**

Juha KINNUNEN, et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. has been transmitted by the International Bureau.
 - c. is not required, as the application was filed in the United States Receiving Office (RO/US).
6. A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. A copy of the International Search Report (PCT/ISA/210).
8. Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. have been transmitted by the International Bureau.
 - c. have not been made; however, the time limit for making such amendments has NOT expired.
 - d. have not been made and will not be made.
9. A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. A **FIRST** preliminary amendment.
16. A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. A substitute specification.
18. A change of power of attorney and/or address letter.
19. Certificate of Mailing by Express Mail
20. Other items or information:

Letter Re Priority
Submission of Application for Filing Date Without Declaration

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR
N/A/K 09622082INTERNATIONAL APPLICATION NO.
PCT/FI99/00075ATTORNEY'S DOCKET NUMBER
990.1234

21. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

<input checked="" type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	\$970.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO	\$840.00
<input type="checkbox"/> International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	\$690.00
<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	\$670.00
<input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	\$96.00

CALCULATIONS PTO USE ONLY**ENTER APPROPRIATE BASIC FEE AMOUNT =**

\$970.00

Surcharge of \$130.00 for furnishing the oath or declaration later than 20 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).

\$130.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	7 - 20 =	0	x \$18.00	\$0.00
Independent claims	3 - 3 =	0	x \$78.00	\$0.00
Multiple Dependent Claims (check if applicable).			<input type="checkbox"/>	\$0.00
			TOTAL OF ABOVE CALCULATIONS =	\$1,100.00
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).			<input type="checkbox"/>	\$0.00
			SUBTOTAL =	\$1,100.00
Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)).			<input type="checkbox"/> 20 <input type="checkbox"/> 30 +	\$0.00
			TOTAL NATIONAL FEE =	\$1,100.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).			<input type="checkbox"/>	\$0.00
			TOTAL FEES ENCLOSED =	\$1,100.00
			Amount to be: refunded	\$
			charged	\$

 A check in the amount of \$1,100.00 to cover the above fees is enclosed. Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed. The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-0518 A duplicate copy of this sheet is enclosed.**NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**

SEND ALL CORRESPONDENCE TO:

STEINBERG & RASKIN, P.C.
1140 Avenue of the Americas, 15th Floor
New York, NY 10036-5803

SIGNATURE

Martin G. Raskin

NAME

25,642

REGISTRATION NUMBER

August 9, 2000

DATE

09/622082

526 Rec'd PCT/PTO 09 AUG 2000

990.1234

UNITED STATES PATENT AND TRADEMARK OFFICE

Re: Application of: Juha KINNUNEN et al.

Serial No.: Not Yet Known

Filed: Date Even Herewith

For:

**APPLICATION OF A LAYER OF
ADMIXTURE IN THE WEB FORMER
UNIT OF A BOARD MACHINE**

PRELIMINARY AMENDMENT

Commissioner of Patents
Washington, D.C. 20231

August 9, 2000

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please amend the specification as follows:

Page 1, line 6, insert --**FIELD OF THE INVENTION**--

Page 1, line 9, insert --**BACKGROUND OF THE INVENTION**--

Page 3, line 14, insert --**OBJECTS AND SUMMARY OF THE INVENTION**--.

Page 3, line 23, insert --**BRIEF DESCRIPTION OF THE DRAWINGS**;

Between lines 23 and 24 insert the following text:

--Fig. 1 is a schematic side elevational view of a first embodiment of a web former unit of a board machine according to the present invention;

Fig. 2 is a schematic side elevational view of a second embodiment of a web former unit of a board machine;

Fig. 3 is a schematic side elevational view illustrating a first introduction method of the admixture, according to the present invention, through a headbox;

Fig. 4 is a schematic side elevational view illustrating a second preferred embodiment of the combination according to the present invention; and

Fig. 5 is a schematic side elevation of another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION--

IN THE CLAIMS:

Please amend the claims as follows.

Claim 1, line 3 change “characterized in that” to --wherein--.

Claim 2, line 1, change “characterized in that” to --wherein--.

Claim 3, line 1, change “or 2, characterized in that” to --, wherein--.

Claim 4, line 1, change “to 3, characterized in that” to --, wherein--.

Claim 5, line 3, change “characterized in that” to --wherein--.

Claim 6, line 1, change “characterized in that” to --wherein--.

Claim 7, line 1, change “characterized in that” to --wherein--.

Please add the following new claims:

--8. A method for layering of an admixture in a web former unit of a board machine in which two or more webs are formed by means of separate web former units and then combined with one another to form a multi-layered web, comprising the steps of:

dividing a flow of fresh stock into at least two component stock flows;

adding of an admixture to a selected one of the at least two component stock flows;

passing said at least two component flows into a multi-layer headbox; and

passing said at least two component flows from said headbox into a gap former;

wherein said selected one of said at least two stock flows is used for forming a first

layer of a web, said first layer having a face that will be placed against and combined with a face of a second layer of said web, said admixture being adapted to increase the fines in said first and second web layers and increasing the bonding strength between said combined faces of said first and second web layers.

9. A method according to claim 8, wherein said admixture includes starch, fines, fillers,

retention agents, hydrophobifying sizes and special chemicals.

10. A method according to claim 8, wherein said fresh stock flow is branched into three separate component flows and said admixtures are added to at least one of said component flows.

11. A method according to claim 8, wherein said admixture is added in an upper-wire unit.

12. A method according to claim 8, wherein said admixture is added at one of a point before a pump, a point after said pump, and a point after a machine screen in said board machine.

13. A method for the manufacture of board in which two or more webs are formed by means of separate web former units and then combined with one another to form a multi-layered web, comprising the steps of:

discharging at least one layer of stock having an admixture from at least one multi-layer headbox to a gap former for forming a first paper web; and

combining said first paper web with at least a second paper web formed by one of a multilayer headbox and normal headbox.

14. A multi-layered board, comprising:

a board; and

a layer of an admixture that has been prepared by means of at least one multi-layer headbox.

15. A board according to claim 14, wherein said admixture includes starch, fines, fillers, retention agents, hydrophobifying sizes and special chemicals.--

REMARKS

The specification has been amended to include section headings at appropriate locations as well as a section briefly describing the figures. It is respectfully requested that the Annexes to the Preliminary Examination Report made under Article 34 be entered for purposes of the present application.

Claims 1-7 as filed under Article 34 have been amended to remove multiple dependencies therefrom in order to reduce the filing fee. No new matter has been added. In addition, new claims 8-15 have been added which are directed to embodiments of the invention disclosed in the specification.

The invention is new, useful and non-obvious

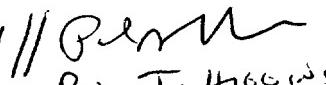
An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

STEINBERG & RASKIN, P.C.


Martin G. Raskin

Reg. No. 25,642


PAUL J. HIGGINS
Reg. No. 44,152

Steinberg & Raskin, P.C.
1140 Avenue of the Americas, 15th Floor
New York, NY 10036-5803
Phone: (212) 768-3800
Fax: (212) 382-2124
E-mail: sr@steinbergraskin.com

Application of a layer of admixture in the web former
unit of a board machine

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The invention concerns a method for application of a layer of admixture in the web former unit of a board machine.

- 10 As is well known, board is almost always made of two or more separate layers. In such a case, the webs formed by two or more wire parts are combined one on top of the other before the press section. In the case of webs produced by means of a conventional fourdrinier wire technique, combining of the surface sides of the webs that are not in contact with the wire does, as a rule, not involve problems, and in
- 15 such a case the strength between the layers in the Z-direction of the web thus obtained, i.e. the "ply bond", is usually adequate. However, when the conventional fourdrinier wire technique is employed, the running speeds are clearly lower than 1000 metres per minute. As the running speeds of the present-day, newer board machines rise to a level higher than 1000 metres per minute, it is necessary to
- 20 employ other techniques, for example the gap former technique. In such a case, it becomes a problem that the combination of two or more webs formed in a gap former does not meet the requirements of strength that have been imposed. The bond strength between the different layers in the web is reduced. What is concerned in particular is the Z-direction strength represented by the what is called "scott bond".
- 25 The poor strength is contributed to by an inadequate concentration of fines on the faces of the layers to be combined. An adequate concentration of fines on the faces to be combined promotes the ply bond between the faces. It has proved problematic to produce board by means of a machine in which the so-called wire sides are combined one against the other. This would be the case always if all the web
- 30 formers were gap formers. This problem sometimes also occurs in combining of webs formed both by means of a hybrid former and by means of a fourdrinier wire.

Attempts have been made to solve the problem, among other things, by spraying starch as a solution or by spraying some other auxiliary agent that increases the bond strength directly onto the web or by introducing a thin layer of extensively ground cellulosic pulp, for example, from a separate headbox, i.e. from a secondary headbox, onto one of the webs to be combined. One mode has been to grind the stock to be passed to one of the layers to an extent clearly higher than normal.

In the following, some prior-art solutions will be described in more detail.

- 10 In the *FI Patent No. 71,377*, a method for manufacture of multi-layer board is described, in which method the stock suspension that forms one of the surface layers is fed onto the horizontal portion of the first wire. Between the layers, a third stock suspension, which forms the intermediate layer, is fed, ahead of the wedge-like gap that is formed by the second wire, onto the web layer that was already formed. After
15 this, the first wire and both of the web layers are passed into contact with the third wire, onto whose horizontal portion the stock suspension is fed which forms the other surface layer. The consistency of the stock suspension that forms the intermediate layer is considerably higher than the consistencies of the stock suspensions that form the surface layers.
- 20 In the *US Patent No. 5,607,555*, a paper machine for manufacture of multi-layer paper is described. In this machine, there are at least two twin-wire formers, which produce a multi-layer paper web, in which connection a paper is obtained whose properties on both faces are equal.
- 25 In the *Finnish Patent No. 92,729*, a stock feed system for a multi-layer headbox and a method in the operation of a multi-layer headbox are described. In this solution, into each inlet header in the multi-layer headbox, a stock produced out of the same fresh stock is introduced, to which stock the necessary chemicals and fillers have
30 been added.

- The prior-art solutions, however, involve a number of significant drawbacks. A separate headbox that sprays starch or fibre stock is an expensive solution, and its use is confined to relatively low speeds, which remain lower than 1000 metres per minute. The starch jets deteriorate the runnability considerably, they block the wires and felts and contaminate the machines, in which case the equipments have to be stopped and cleaned rather frequently. Thus, the necessary auxiliary agents cannot be added selectively either. In most systems, a number of separate stock lines are needed, in which case the system is rather heavy and expensive to operate. Grinding of one of the stock layers deteriorates the draining of water clearly, and thereby it deteriorates the runnability and the efficiency of production and increases the costs.
- In an attempt to attain speeds higher than 1000 metres per minute, such restrictions cannot be tolerated, and a separate jet of admixture that promotes the binding together of the different layers would not be even possible at these speeds.
- 15 The method in accordance with the invention for application of a layer of admixture in the web former unit of a board machine, the method for manufacture of board, and the board are mainly characterized in what is stated in the patent claims.
- 20 The invention will be described in the following in more detail with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawings, the invention being, however, not supposed to be confined to said embodiments alone.
- 25 Fig. 1 illustrates a preferred embodiment of the invention, which is in particular suitable for manufacture of board and in which the stock flow produced out of the same fresh stock is divided into two component flows. To the face that will be placed against the face of the layer to be combined, the necessary admixtures are added in order to increase the fines content in the layer and to promote the bond strength between the faces to an optimal extent at an optimal point. The component flows are passed into a multi-layer headbox and from it into a gap former. In this way, good properties of formation and strength and good internal bond strength are obtained for the board. Thus, out of the same fresh stock 11, two component flows

12₁ and 12₂ are produced. To the component flow 12₁, out of which the face will be formed that will be placed against the face of the layer to be combined, at the point 14₁ before the pump 22, at the point 14₂ after the pump 22, and/or at the point 14₃ after the machine screen 33, the admixtures are added in order to increase the fines content in the layer and the bond strength between the faces. After this the component flows 12₁ and 12₂ are passed into the multi-layer headbox 44, which comprises, in the conventional way, inlet headers, a tube manifold connected with each inlet header, an intermediate chamber connected with the tube manifold, a turbulence generator and turbulence tubes, a slice cone after the turbulence generator, and vanes that separate the layers in said slice cone. From the headbox the web is transferred into the former, in which 55₁ represents the first forming wire, 55₂ the second forming wire, 66₁ represents a former roll, and 66₂ the forming roll.

Fig. 2 illustrates a second preferred embodiment of the invention, in which the stock flow produced out of the same fresh stock is divided into three component flows, of which flows, onto the faces that will be fitted against the faces of the layers to be combined, the necessary admixtures will be added in order to increase the fines contents in the layers and to promote the bond strength between the faces to an optimal extent and at an optimal point. After that, the component flows are passed into a multi-layer headbox and further into a gap former. In this solution, out of the same fresh stock 11, three separate component flows 12₁, 12₂ and 12₃ are formed. To the faces that are formed on the component flows 12₁ and 12₃ and that will be placed against the faces of the layers to be combined, at the points 14₁ before the pumps 22₁ and 22₃, at the points 14₂ after the pumps 22₁ and 22₃, and/or at the points 14₃ after the machine screens 33₁ and 33₃, the admixtures are added in order to increase the fines contents in the layers and the bond strength between the faces. After this the component flows 12₁, 12₂ and 12₃ are passed into the multi-layer headbox 44 and further into the gap former. As an alternative solution, the admixtures can be added to one component flow 12₁, 12₂ or 12₃ only.

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Fig. 3 shows a preferred combination in accordance with the invention, in which the layer 13 that contains an admixture and that is to be combined is introduced through

a twin-layer headbox 44₁ into a gap former, and the web thus obtained is combined with a second web, which is derived from a normal headbox 44₂ and from a second gap former. The numeral 55₁ represents the first forming wire, 55₂ the second, 55₃ the third, and 55₄ represents the fourth forming wire.

Fig. 4 shows a second preferred combination in accordance with the invention, in which the layers 13₁ and 13₂ that contain an admixture and that are to be combined are introduced into two separate multi-layer headboxes, herein twin-layer headboxes 44₃, 44₄, and the webs that contain admixtures are passed into gap formers and then combined with each other. When two layers that contain admixtures are combined, a stronger bonding layer is obtained, which is necessary in applications that require higher strength.

Fig. 5 shows a solution in which the outermost layers 13₃ and 13₄ of a three-layer headbox 44₅, which outer layers contain admixtures, operate as bonding layers, with which the stock layers derived from two normal headboxes 44₆ and 44₇ are combined. The numerals 55₁...55₆ represent the forming wires.

In the solutions in accordance with the invention, it is an essential feature that in the manufacture of board it is possible to employ a gap former in a multi-layer technique at high speeds of levels higher than 1000 metres per minute. In such a case, the admixture that increases the fines content and/or the bond strength is applied as a layer onto the face that will be placed against the face of the layer to be combined. Thus, a higher fines content is obtained on the face that will be placed, for example, against the face of a middle layer, in which connection the binding strength and the internal bond strength between the layers are increased. When the solution in accordance with the invention is employed in a 3-layer headbox, it is preferable to feed the admixtures onto the outermost faces. The agents that can be applied in this way as layers are starch, fillers, fines, retention agents, such as polyacrylamide, polyacrylimide, special chemicals, hydrophobifying sizes, and equivalent. In this solution it is also favourably possible to use the same fresh stock and one basic stock line. Further, it is possible to amend the poor properties of a gap former, to improve

the runnability and to help the machine to remain clean. In the solution in accordance with the invention, the distribution of the fibre-based fines, fillers and starch in the surface, frame and/or bottom layers of the board is regulated so that the concentration of said agents is higher at the face that will be placed against the middle layer. The amount of admixture can be optimized, and so also the location at which it is added, in which way an optimal bond between the layers is obtained. This is also reflected in the printing quality of the product. The admixture or admixtures can be applied as layers on the face to be combined only, or alternatively also on several layers consisting of component flows.

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By means of the invention, the face of the web to be combined that will enter into contact with a second web can be made favourably in view of the bond strength. Thus, said face is already formed in the headbox such that it is favourable in view of bonding properties by means of fines or concentration of starch or equivalent. By means of the order and amount of adding, it is also possible to have a substantial effect on the properties that are desirable in the product or in the process. Besides the application of admixtures as layers in the way described in the present invention, of course, it is also possible to carry out conventional metering of admixtures in the normal way. Since the present invention permits the use of gap formers in the manufacture of board in stead of the conventional fourdrinier wire technique, no large wire pit is needed, the equipment requires less space, it is possible to use smaller amounts of water, fewer dewatering elements, and it is also possible to run at a higher consistency than in the case of a fourdrinier wire. The method in accordance with the present invention can be employed both in an upper-wire unit and on the what is called frame layer. In the manufacture of some special products, this method can also be substituted for a secondary headbox altogether.

Claims

1. A method for layering of an admixture in a web former unit of a board machine in which two or more webs are formed by means of separate web former units and then combined with one another to form a multi-layer web, **characterized** in that a flow of fresh stock (11) is divided into at least two component stock flows (12₁ and 12₂) and admixtures are added to at least one component flow (12₁) that will form a face that will be placed against and combined with the face of a web formed by another web former unit in order to increase the contents of fines in the web layers and the bonding strength between the faces to be combined, said admixtures being added at a point (14₁) before a pump (22), at a point (14a₂) after the pump (22), and/or at a point (14₃) after a machine screen, and after this the component flows (12₁ and 12₂) are passed into a multi-layer headbox (44) and further into a gap former.
- 15 2. A method as claimed in claim 1, **characterized** in that the admixture includes starch, fines, fillers, retention agents, hydrophobifying sizes, and special chemicals.
- 10 3. A method as claimed in claim 1 or 2, **characterized** in that the fresh stock flow (11) is branched into three separate component flows (12₁, 12₂, 12₃), of which the admixtures are added to at least one component flow (12₁).
- 15 4. A method as claimed in any of the claims 1 to 3, **characterized** in that the layering of an admixture takes place in an upper-wire unit.
- 20 5. A method for manufacture of board in which two or more webs are formed by means of separate web former units and then combined with one another to form a multi-layer web, **characterized** in that at least one layer of stock discharged from at least one multi-layer headbox to a gap former includes an admixture and the web formed by means of said gap former is combined with at least one web which is derived from a second combination of a multi-layer headbox or a normal headbox and a gap former.

08 -03- 2000

6. A multi-layer board, characterized in that the board comprises a layer of an admixture that has been prepared by means of at least one multi-layer headbox.

7. A board as claimed in claim 6, characterized in that the admixture includes starch, fines, fillers, retention agents, hydrophobifying sizes, and special chemicals.

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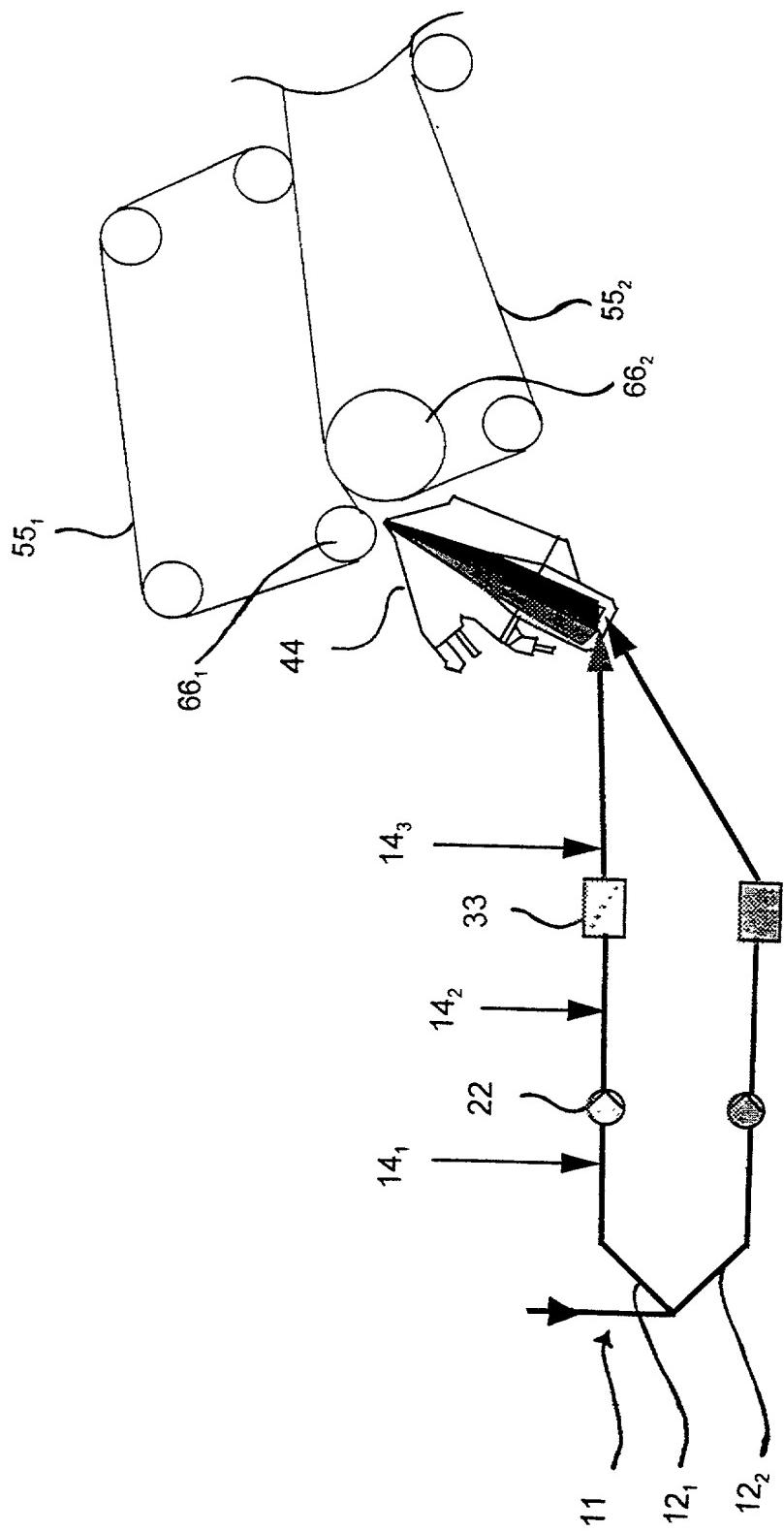


Fig. 1

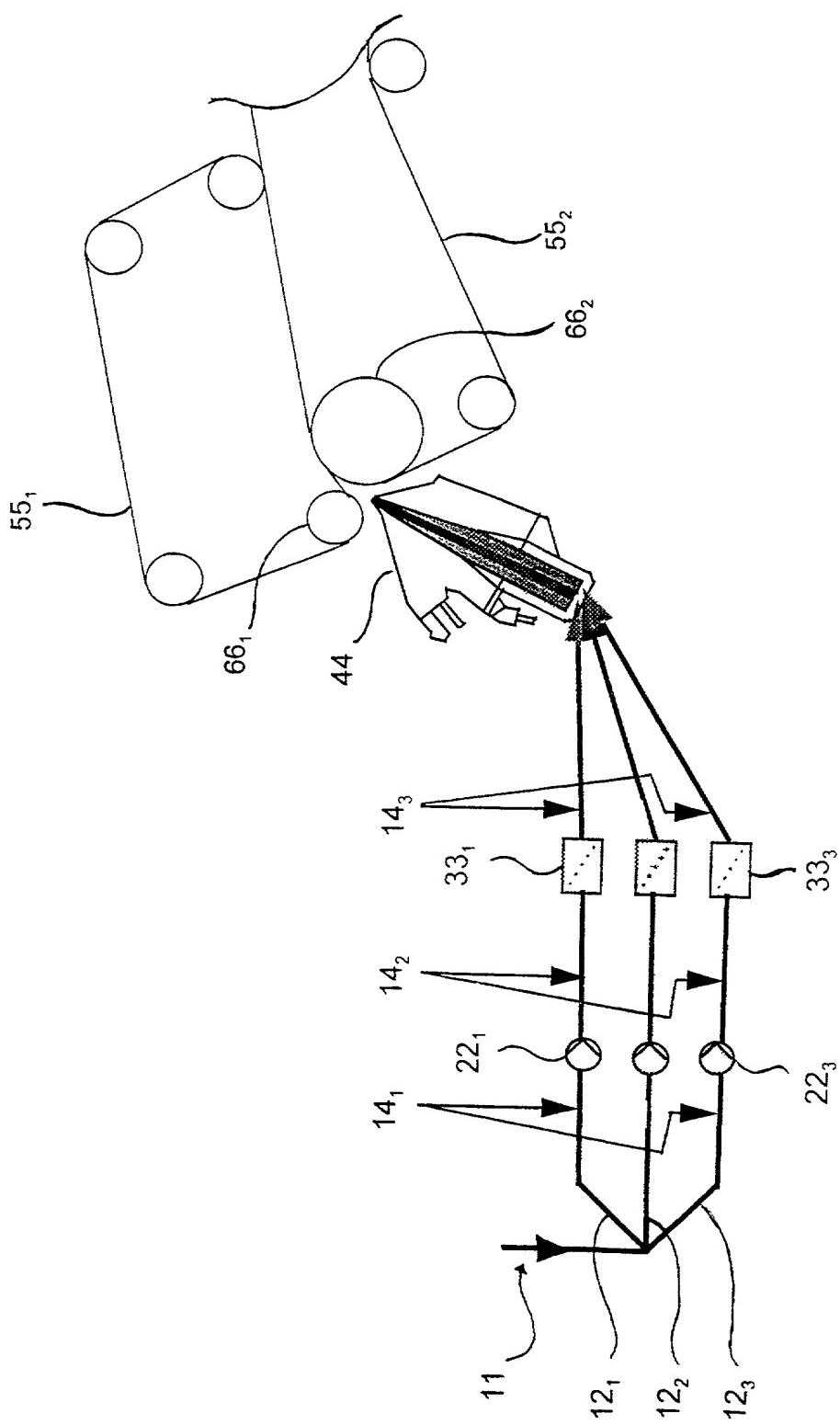


Fig. 2

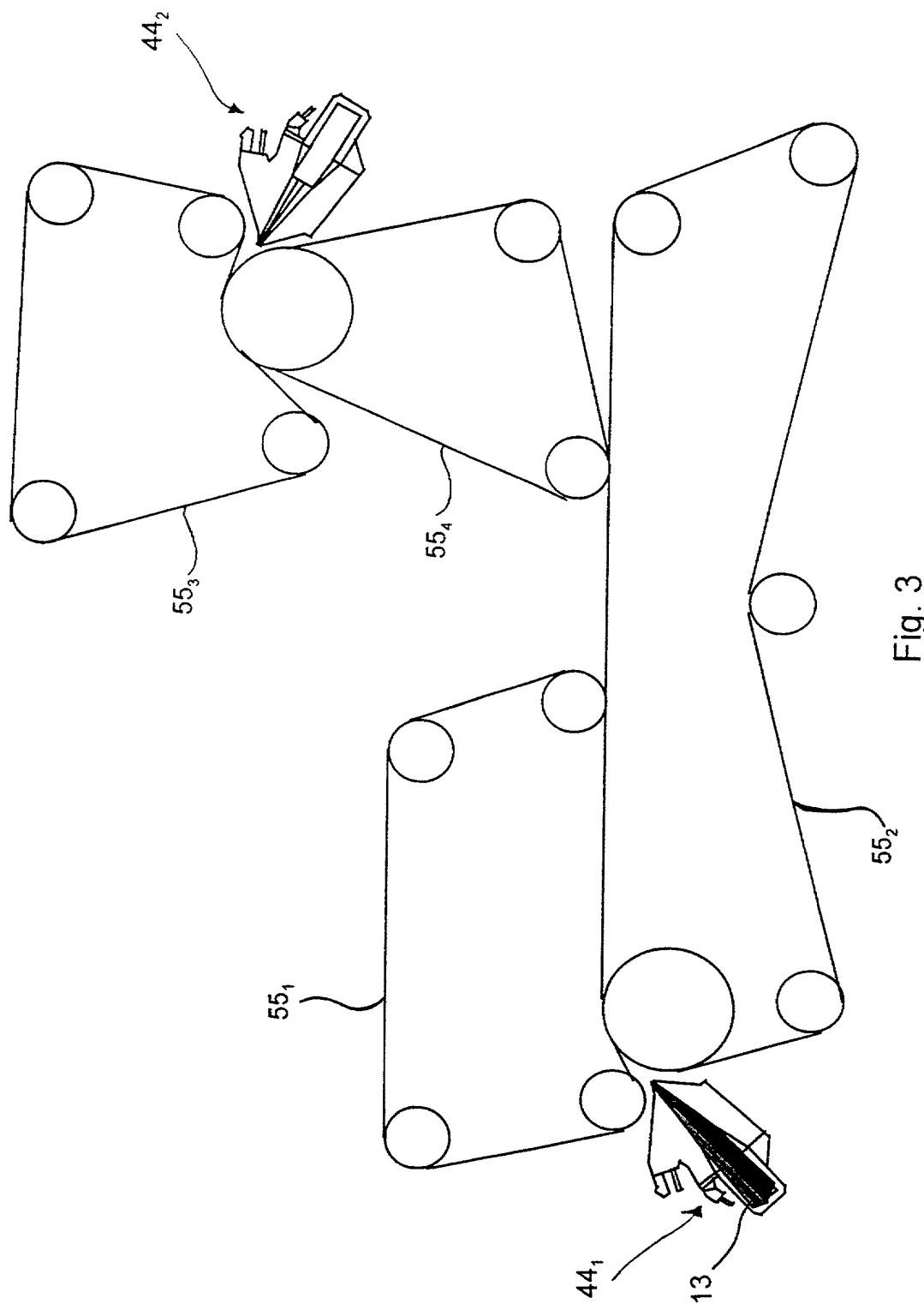


Fig. 3

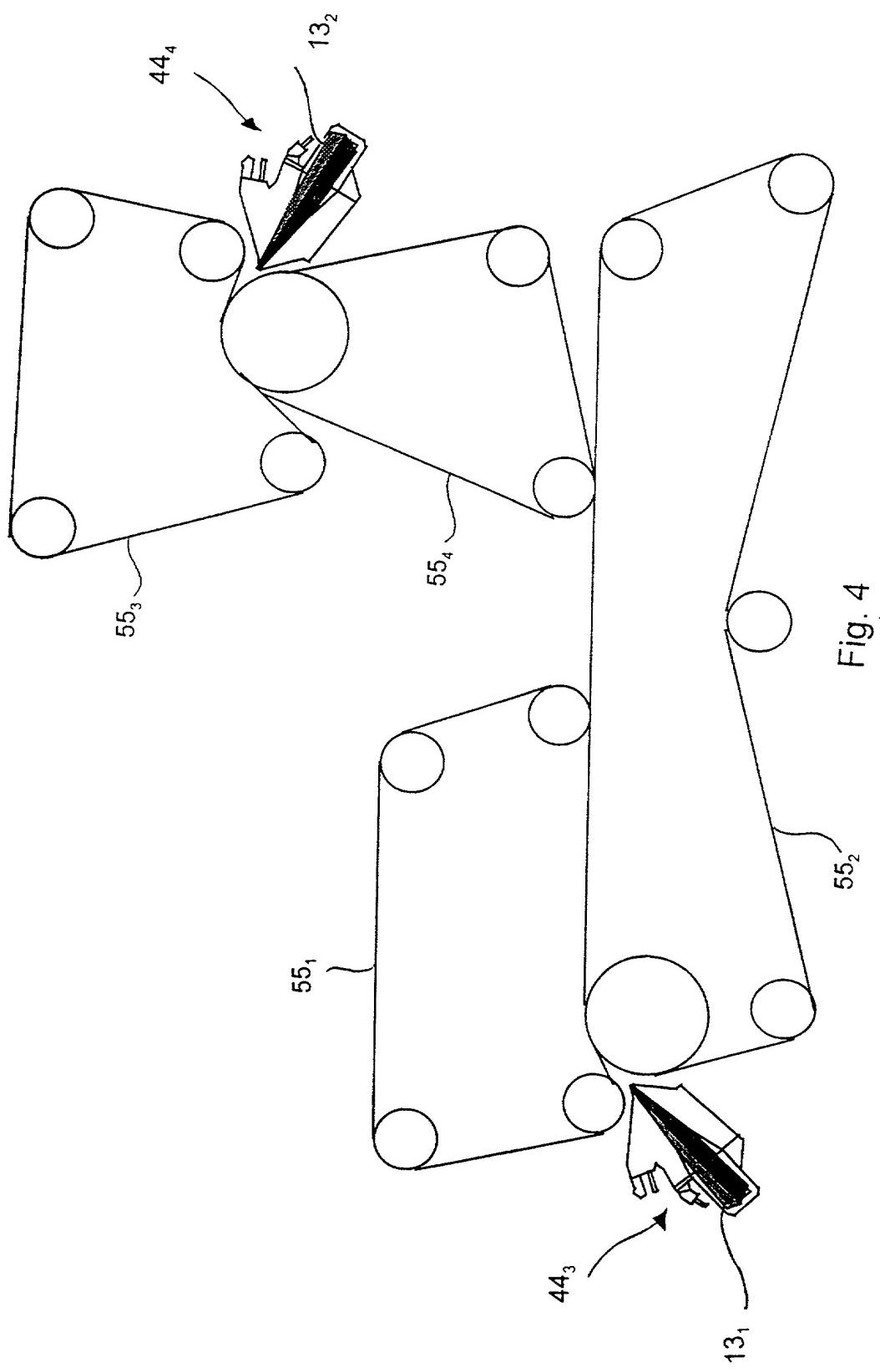


Fig. 4

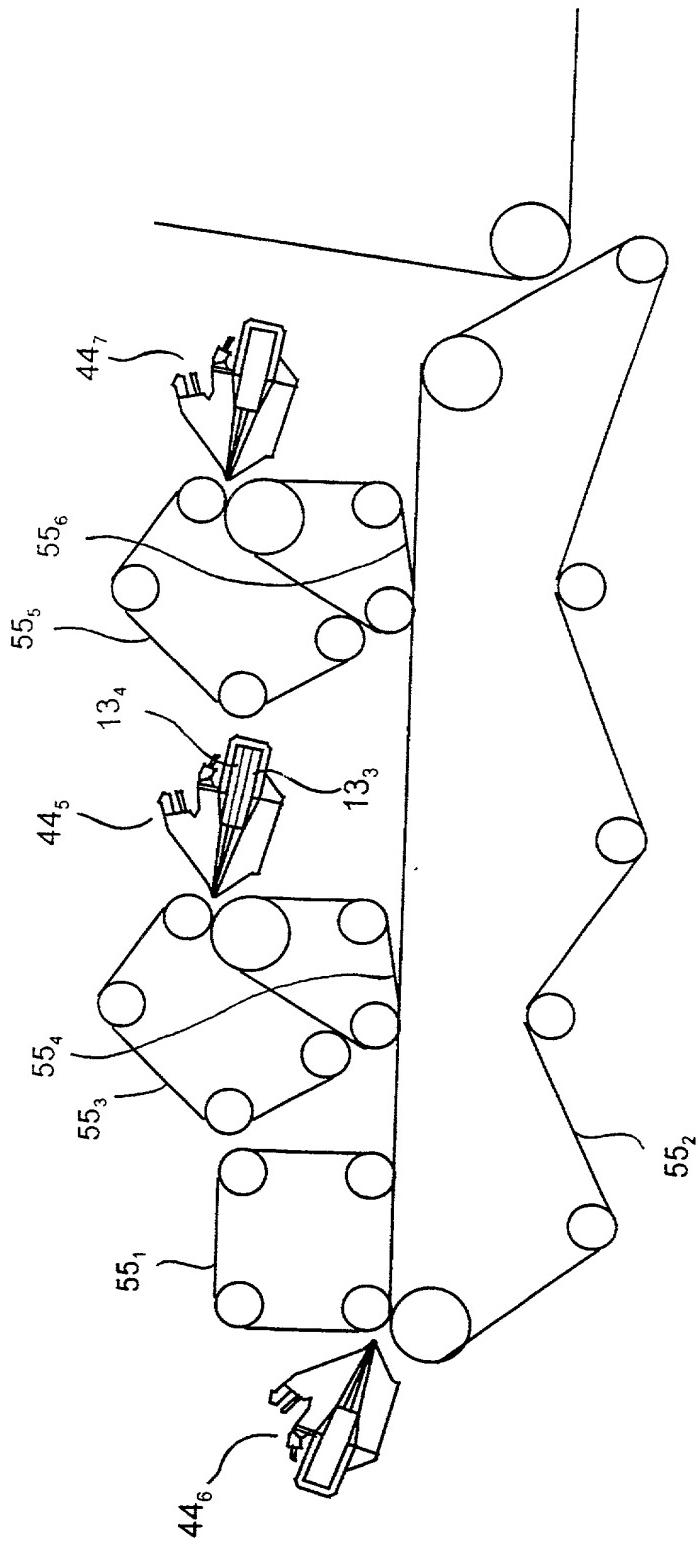


Fig. 5

U.S.A.
DECLARATION AND POWER OF ATTORNEY

As the below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **Applicatiuon of a layer of admixture in the web former unit of a board machine**

the specification of which (check one)

is attached hereto.

was filed on August 9, 2000 as Application Serial No.09/622,082 and was amended on August 9, 2000 (if applicable). I Herby authorize and request my attorney, Steinberg & Raskin, P.C. of 1140 Avenue of the Americas, New York, New York 10036 to insert the filing date and application number when known.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is known to us to be material to the patentability of this application as defined in Title 37, Code of Federal Regulations §1.56.

I hereby claim priority benefits under Title 35, United States Code, §119 of any foreign and/or provisional application(s) for patent or inventor's certificate listed below and have also identified below any foreign and/or provisional application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

PRIOR APPLICATION(S) Priority claimed

980287	Finland	February 9, 1998	X	Yes	No
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I Hereby claim the benefit under Title 35, United States Code, §120 of any United States applications(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/FI99/00075	February 3, 1999	pending
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And I hereby appoint

Martin G. Raskin, Registration No. 25,642,
Harold D. Steinberg, Registration No. 17,255,
5 Joshua L. Raskin, Registration No. 40,135,
Anthony L. Meola, Registration No. P44,936,
Jason E. Hardiman, Registration No. 36,157

my attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith; correspondence address:

STEINBERG & RASKIN, P.C.
1140 Avenue of the Americas
New York, N.Y. 10036;
Telephone: (212) 768-3800; Fax: (212) 382-2124.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first
inventor

Juha S. KINNUNEN

Inventor's signature

Date

31.7.2000

Residence

Jyväskylä, Finland

Citizenship

Finnish

Post Office Address

Hauhontie 35 A 4, FIN-40520 Jyväskylä, Finland

Full name of second
inventor

Hannu KORHONEN

Inventor's signature

Date

31.7.2000

Residence

Jyväskylä, Finland

Citizenship

Finnish

Post Office Address

Hollituvantie 23, FIN-40200 Jyväskylä, Finland

Full name of third
inventor

Kari RÄISÄNEN

Inventor's signature



Date

31.7.2000

Residence

Tampere, Finland

Citizenship

Finnish

Post Office Address

Likolammenkatu 3 F 53, FIN-33300 Tampere, Finland

Full name of fourth
inventor

Mika VIERTOLA

Inventor's signature



Date

31.7.2000

Residence

Jyväskylä, Finland

Citizenship

Finnish

Post Office Address

Hukkaperä 2 B 6, FIN-40400 Jyväskylä, Finland

Full name of fifth
inventor

Inventor's signature

Date

Residence

Citizenship

Post Office Address

Full name of sixth
inventor

Inventor's signature

Date

Residence

Citizenship

Post Office Address